



Service Manual

Lexmark™ C500n

5023-110

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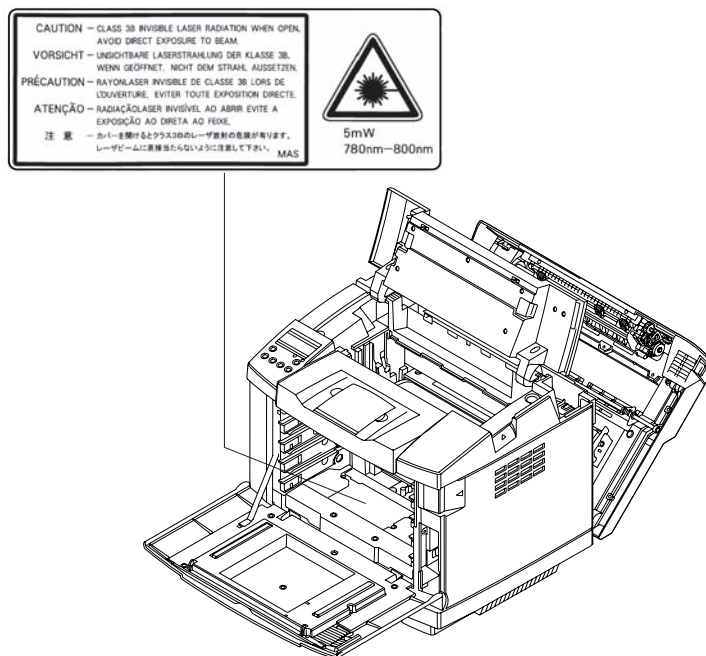
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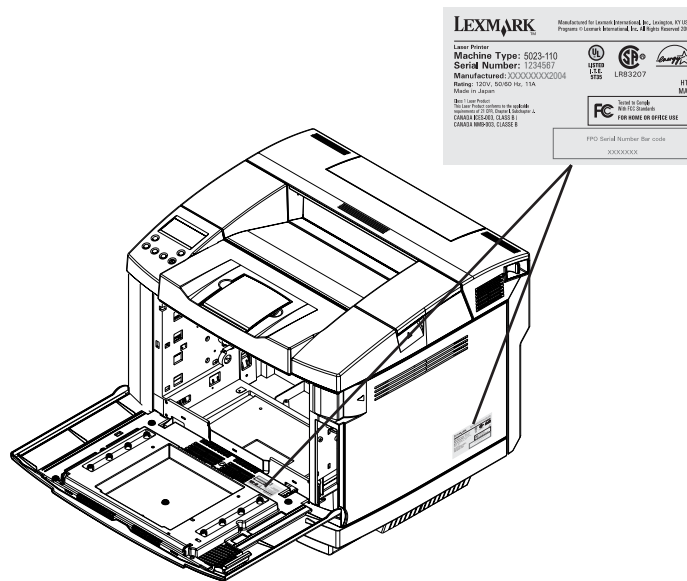
Laser notices

The following laser notice labels may be affixed to this printer as shown:

Laser advisory label



Class 1 Laser statement label



Laser notice

The printer is certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for Class I (1) laser products, and elsewhere is certified as a Class I laser product conforming to the requirements of IEC 60825-1.

Class I laser products are not considered to be hazardous. The printer contains internally a Class IIIb (3b) laser that is nominally a 5 milliwatt gallium arsenide laser operating in the wavelength region of 770-795 nanometers. The laser system and printer are designed so there is never any human access to laser radiation above a Class I level during normal operation, user maintenance, or prescribed service condition.

Laser

Der Drucker erfüllt gemäß amtlicher Bestätigung der USA die Anforderungen der Bestimmung DHHS (Department of Health and Human Services) 21 CFR Teil J für Laserprodukte der Klasse I (1). In anderen Ländern gilt der Drucker als Laserprodukt der Klasse I, der die Anforderungen der IEC (International Electrotechnical Commission) 60825-1 gemäß amtlicher Bestätigung erfüllt.

Laserprodukte der Klasse I gelten als unschädlich. Im Inneren des Druckers befindet sich ein Laser der Klasse IIIb (3b), bei dem es sich um einen Galliumarsenlaser mit 5 Milliwatt handelt, der Wellen der Länge 770-795 Nanometer ausstrahlt. Das Lasersystem und der Drucker sind so konzipiert, daß im Normalbetrieb, bei der Wartung durch den Benutzer oder bei ordnungsgemäßer Wartung durch den Kundendienst Laserbestrahlung, die die Klasse I übersteigen würde, Menschen keinesfalls erreicht.

Avis relatif à l'utilisation de laser

Pour les Etats-Unis : cette imprimante est certifiée conforme aux provisions DHHS 21 CFR alinéa J concernant les produits laser de Classe I (1). Pour les autres pays : cette imprimante répond aux normes IEC 60825-1 relatives aux produits laser de Classe I.

Les produits laser de Classe I sont considérés comme des produits non dangereux. Cette imprimante est équipée d'un laser de Classe IIIb (3b) (arséniure de gallium d'une puissance nominale de 5 milliwatts) émettant sur des longueurs d'onde comprises entre 770 et 795 nanomètres. L'imprimante et son système laser sont conçus pour impossible, dans des conditions normales d'utilisation, d'entretien par l'utilisateur ou de révision, l'exposition à des rayonnements laser supérieurs à des rayonnements de Classe I.

Avvertenze sui prodotti laser

Questa stampante è certificata negli Stati Uniti per essere conforme ai requisiti del DHHS 21 CFR Sottocapitolo J per i prodotti laser di classe 1 ed è certificata negli altri Paesi come prodotto laser di classe 1 conforme ai requisiti della norma CEI 60825-1.

I prodotti laser di classe non sono considerati pericolosi. La stampante contiene al suo interno un laser di classe IIIb (3b) all'arseniuro di gallio della potenza di 5mW che opera sulla lunghezza d'onda compresa tra 770 e 795 nanometri. Il sistema laser e la stampante sono stati progettati in modo tale che le persone a contatto con la stampante, durante il normale funzionamento, le operazioni di servizio o quelle di assistenza tecnica, non ricevano radiazioni laser superiori al livello della classe 1.

Avisos sobre el láser

Se certifica que, en los EE.UU., esta impresora cumple los requisitos para los productos láser de Clase I (1) establecidos en el subcapítulo J de la norma CFR 21 del DHHS (Departamento de Sanidad y Servicios) y, en los demás países, reúne todas las condiciones expuestas en la norma IEC 60825-1 para productos láser de Clase I (1).

Los productos láser de Clase I no se consideran peligrosos. La impresora contiene en su interior un láser de Clase IIIb (3b) de arseniuro de galio de funcionamiento nominal a 5 milivatios en una longitud de onda de 770 a 795 nanómetros. El sistema láser y la impresora están diseñados de forma que ninguna persona pueda verse afectada por ningún tipo de radiación láser superior al nivel de la Clase I durante su uso normal, el mantenimiento realizado por el usuario o cualquier otra situación de servicio técnico.

Declaração sobre Laser

A impressora está certificada nos E.U.A. em conformidade com os requisitos da regulamentação DHHS 21 CFR Subcapítulo J para a Classe I (1) de produtos laser. Em outros locais, está certificada como um produto laser da Classe I, em conformidade com os requisitos da norma IEC 60825-1.

Os produtos laser da Classe I não são considerados perigosos. Internamente, a impressora contém um produto laser da Classe IIIb (3b), designado laser de arseneto de potássio, de 5 milliwatts, operando numa faixa de comprimento de onda entre 770 e 795 nanómetros. O sistema e a impressora laser foram concebidos de forma a nunca existir qualquer possibilidade de acesso humano a radiação laser superior a um nível de Classe I durante a operação normal, a manutenção feita pelo utilizador ou condições de assistência prescritas.

Laserinformatie

De printer voldoet aan de eisen die gesteld worden aan een laserprodukt van klasse I. Voor de Verenigde Staten zijn deze eisen vastgelegd in DHHS 21 CFR Subchapter J, voor andere landen in IEC 60825-1.

Laserprodukten van klasse I worden niet als ongevaarlijk aangemerkt. De printer is voorzien van een laser van klasse IIb (3b), dat wil zeggen een gallium arsenide-laser van 5 milliwatt met een golflengte van 770-795 nanometer. Het lasergedeelte en de printer zijn zo ontworpen dat bij normaal gebruik, bij onderhoud of reparatie conform de voorschriften, nooit blootstelling mogelijk is aan laserstraling boven een niveau zoals voorgeschreven is voor klasse 1.

Lasermeddelelse

Printeren er godkendt som et Klasse I-laserprodukt, i overensstemmelse med kravene i IEC 60825-1.

Klasse I-laserprodukter betragtes ikke som farlige. Printeren indeholder internt en Klasse IIb (3b)-laser, der nominelt er en 5 milliwatt galliumarsenid laser, som arbejder på bølglængdeområdet 770-795 nanometer. Lasersystemet og printeren er udformet således, at mennesker aldrig udsættes for en laserstråling over Klasse I-niveau ved normal drift, brugervedligeholdelse eller obligatoriske servicebetingelser.

Huomautus laserlaitteesta

Tämä kirjoitin on Yhdysvalloissa luokan I (1) laserlaitteiden DHHS 21 CFR Subchapter J -määrityksen mukainen ja muualla luokan I laserlaitteiden IEC 60825-1 -määrityksen mukainen.

Luokan I laserlaitteiden ei katsota olevan vaarallisia käyttäjälle. Kirjoittimessa on sisäinen luokan IIIb (3b) 5 milliwatin galliumarsenidilaser, joka toimii aaltoalueella 770 - 795 nanometriä. Laserjärjestelmä ja kirjoitin on suunniteltu siten, että käyttäjä ei altistu luokan I määräyksiä voimakkaammalle säteilylle kirjoittimen normaalin toiminnan, käyttäjän tekemien huoltotoimien tai muiden huoltotoimien yhteydessä.

VARO! Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.

VARNING! Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

Laser-notis

Denna skrivare är i USA certifierad att motsvara kraven i DHHS 21 CFR, underparagraf J för laserprodukter av Klass I (1). I andra länder uppfyller skrivaren kraven för laserprodukter av Klass I enligt kraven i IEC 60825-1.

Laserprodukter i Klass I anses ej hälsovådliga. Skrivaren har en inbyggd laser av Klass IIIb (3b) som består av en laserenhet av gallium-arsenid på 5 milliwatt som arbetar i våglängdsområdet 770-795 nanometer. Lasersystemet och skrivaren är utformade så att det aldrig finns risk för att någon person utsätts för laserstrålning över Klass I-nivå vid normal användning, underhåll som utförs av användaren eller annan föreskriven serviceåtgärd.

Laser-melding

Skriveren er godkjent i USA etter kravene i DHHS 21 CFR, underkapittel J, for klasse I (1) laserprodukter, og er i andre land godkjent som et Klasse I-laserprodukt i samsvar med kravene i IEC 60825-1.

Klasse I-laserprodukter er ikke å betrakte som farlige. Skriveren inneholder internt en klasse IIIb (3b)-laser, som består av en gallium-arsenlaserenhet som avgir stråling i bølgelengdeområdet 770-795 nanometer. Lasersystemet og skriveren er utformet slik at personer aldri utsettes for laserstråling ut over klasse I-nivå under vanlig bruk, vedlikehold som utføres av brukeren, eller foreskrevne serviceoperasjoner.

Avís sobre el Làser

Segons ha estat certificat als Estats Units, aquesta impressora compleix els requisits de DHHS 21 CFR, apartat J, pels productes làser de classe I (1), i segons ha estat certificat en altres llocs, és un producte làser de classe I que compleix els requisits d'IEC 60825-1.

Els productes làser de classe I no es consideren perillosos. Aquesta impressora conté un làser de classe IIIb (3b) d'arseniür de gal.li, nominalment de 5 mil.liwats, i funciona a la regió de longitud d'ona de 770-795 nanòmetres. El sistema làser i la impressora han sigut concebut de manera que mai hi hagi exposició a la radiació làser per sobre d'un nivell de classe I durant una operació normal, durant les tasques de manteniment d'usuari ni durant els serveis que satisfacin les condicions prescrites.

Japanese laser notice

レーザーに関するお知らせ

このプリンターは、米国ではDHHS 21 CFRサブチャプターJのクラスI (1)の基準を満たしたレーザー製品であることが証明されています。また米国以外ではIEC 825の基準を満たしたクラスIのレーザー製品であることが証明されています。

クラスIのレーザー製品には危険性はないと考えられています。このプリンターはクラスIIIb (3b)のレーザーを内蔵しています。このレーザーは、波長が770 ～ 795ナノメートルの範囲で、通常5ミリワットのガリウム砒化物を放射するレーザーです。このレーザーシステムとプリンターは、通常の操作、ユーザのメンテナンス、規定された修理においては、人体がクラスIのレベル以上のレーザー放射に晒されることのないよう設計されています。

Chinese laser notice

注意：

本打印机被美国认证合乎 DHHS 21 CFR Subchapter I 对分类 I (1) 激光产品的标准，而在其他地区则被认证合乎 IEC 825 的标准。


分类 I 激光产品一般认为不具危险性，本打印机内部含有分类 IIIb (3b) 的激光，在操作过程中会产生 5 毫瓦含镓及砷的微量激光，其波长范围在 770-795 nm 之间。本激光系统及打印机的设计，在一般操作、使用者维护或规定内的维修情况下，不会使人体接触分类 I 以上等级的辐射。

Korean laser notice


본프린터는 1등급 레이저 제품들에 대한 DHHS 21 CFR Subchapter 3의 규정을 준수하고 있음을 미국에서 인증받았으며, 그외의 나라에서도 IEC 825 규정을 준수하는 1등급 레이저 제품으로서 인증을 받았습니다.

1등급 레이저 제품들은 안전한 것으로 간주됩니다. 본 프린터는 5 밀리와트 갈륨 아르세나이드 레이저로서 770-795 나노미터의 파장대에서 활동하는 Class III (3b) 레이저를 내부에 갖고 있습니다. 본 레이저 시스템과 프린터는 정상 작동 중이나 유지 보수 중 또는 규정된 서비스 상태에서 상기의 Class I 수준의 레이저 방출에 사람이 절대 접근할 수 없도록 설계되어 있습니다.


Safety information

- The safety of this product is based on testing and approvals of the original design and specific components. The manufacturer is not responsible for safety in the event of use of unauthorized replacement parts.
- The maintenance information for this product has been prepared for use by a professional service person and is not intended to be used by others.
- There may be an increased risk of electric shock and personal injury during disassembly and servicing of this product. Professional service personnel should understand this and take necessary precautions.
-  **CAUTION:** When you see this symbol, there is a danger from hazardous voltage in the area of the product where you are working. Unplug the product before you begin, or use caution if the product must receive power in order to perform the task.


Consignes de sécurité

- La sécurité de ce produit repose sur des tests et des agrégations portant sur sa conception d'origine et sur des composants particuliers. Le fabricant n'assume aucune responsabilité concernant la sécurité en cas d'utilisation de pièces de rechange non agréées.
- Les consignes d'entretien et de réparation de ce produit s'adressent uniquement à un personnel de maintenance qualifié.
- Le démontage et l'entretien de ce produit pouvant présenter certains risques électriques, le personnel d'entretien qualifié devra prendre toutes les précautions nécessaires.
-  **ATTENTION :** Ce symbole indique la présence d'une tension dangereuse dans la partie du produit sur laquelle vous travaillez. Débranchez le produit avant de commencer ou faites preuve de vigilance si l'exécution de la tâche exige que le produit reste sous tension.


Norme di sicurezza

- La sicurezza del prodotto si basa sui test e sull'approvazione del progetto originale e dei componenti specifici. Il produttore non è responsabile per la sicurezza in caso di sostituzione non autorizzata delle parti.
- Le informazioni riguardanti la manutenzione di questo prodotto sono indirizzate soltanto al personale di assistenza autorizzato.
- Durante lo smontaggio e la manutenzione di questo prodotto, il rischio di subire scosse elettriche e danni alla persona è più elevato. Il personale di assistenza autorizzato deve, quindi, adottare le precauzioni necessarie.
-  **ATTENZIONE:** Questo simbolo indica la presenza di tensione pericolosa nell'area del prodotto. Scollegare il prodotto prima di iniziare o usare cautela se il prodotto deve essere alimentato per eseguire l'intervento.


Sicherheitshinweise

- Die Sicherheit dieses Produkts basiert auf Tests und Zulassungen des ursprünglichen Modells und bestimmter Bauteile. Bei Verwendung nicht genehmigter Ersatzteile wird vom Hersteller keine Verantwortung oder Haftung für die Sicherheit übernommen.
- Die Wartungsinformationen für dieses Produkt sind ausschließlich für die Verwendung durch einen Wartungsfachmann bestimmt.
- Während des Auseinandernehmens und der Wartung des Geräts besteht ein zusätzliches Risiko eines elektrischen Schlags und körperlicher Verletzung. Das zuständige Fachpersonal sollte entsprechende Vorsichtsmaßnahmen treffen.
-  **ACHTUNG:** Dieses Symbol weist auf eine gefährliche elektrische Spannung hin, die in diesem Bereich des Produkts auftreten kann. Ziehen Sie vor den Arbeiten am Gerät den Netzstecker des Geräts, bzw. arbeiten Sie mit großer Vorsicht, wenn das Produkt für die Ausführung der Arbeiten an den Strom angeschlossen sein muß.


Pautas de Seguridad

- La seguridad de este producto se basa en pruebas y aprobaciones del diseño original y componentes específicos. El fabricante no es responsable de la seguridad en caso de uso de piezas de repuesto no autorizadas.
- La información sobre el mantenimiento de este producto está dirigida exclusivamente al personal cualificado de mantenimiento.
- Existe mayor riesgo de descarga eléctrica y de daños personales durante el desmontaje y la reparación de la máquina. El personal cualificado debe ser consciente de este peligro y tomar las precauciones necesarias.
-  **PRECAUCIÓN:** este símbolo indica que el voltaje de la parte del equipo con la que está trabajando es peligroso. Antes de empezar, desenchufe el equipo o tenga cuidado si, para trabajar con él, debe conectarlo.


Informações de Segurança

- A segurança deste produto baseia-se em testes e aprovações do modelo original e de componentes específicos. O fabricante não é responsável pela segurança, no caso de uso de peças de substituição não autorizadas.
- As informações de segurança relativas a este produto destinam-se a profissionais destes serviços e não devem ser utilizadas por outras pessoas.
- Risco de choques eléctricos e ferimentos graves durante a desmontagem e manutenção deste produto. Os profissionais destes serviços devem estar avisados deste facto e tomar os cuidados necessários.
-  **CUIDADO:** Quando vir este símbolo, existe a possível presença de uma potencial tensão perigosa na zona do produto em que está a trabalhar. Antes de começar, desligue o produto da tomada eléctrica ou seja cuidadoso caso o produto tenha de estar ligado à corrente eléctrica para realizar a tarefa necessária.


Informació de Seguretat

- La seguretat d'aquest producte es basa en l'avaluació i aprovació del disseny original i els components específics.
El fabricant no es fa responsable de les qüestions de seguretat si s'utilitzen peces de recanvi no autoritzades.
- La informació pel manteniment d'aquest producte està orientada exclusivament a professionals i no està destinada a ningú que no ho sigui.
- El risc de xoc elèctric i de danys personals pot augmentar durant el procés de desmuntatge i de servei d'aquest producte. El personal professional ha d'estar-ne assabentat i prendre les mesures convenients.
-  **PRECAUCIÓ:** aquest símbol indica que el voltatge de la part de l'equip amb la qual esteu treballant és perillós. Abans de començar, desendolieu l'equip o extremeu les precaucions si, per treballar amb l'equip, l'heu de connectar.

안전 사항

- 본 제품은 원래 설계 및 특정 구성품에 대한 테스트 결과로 안정성이 입증된 것입니다. 따라서 무허가 교체부품을 사용하는 경우에는 제조업체에서 안전에 대한 책임을 지지 않습니다.
- 본 제품에 관한 유지 보수 설명서는 전문 서비스 기술자 용으로 작성된 것이므로, 비전문가는 사용할 수 없습니다.
- 본 제품을 해체하거나 정비할 경우, 전기적인 충격을 받거나 상처를 입을 위험이 커집니다. 전문 서비스 기술자는 이 사실을 숙지하고, 필요한 예방 조치를 취하도록 하십시오.
-  **주의:** 이 표시는 해당영역에서 고압전류가 흐른다는 위험 표시입니다. 시작전에 플러그를 뽑으시거나, 주의를 기울여 주시기 바랍니다.

安全信息

- 本产品的安全性以原来设计和特定产品的测试结果和认证为基础。万一使用未经许可的替换部件，制造商不对安全性负责。
- 本产品的维护信息仅供专业服务人员使用，并不打算让其他人使用。
- 本产品在拆卸、维修时，遭受电击或人员受伤的危险性会增高，专业服务人员对这点必须有所了解，并采取必要的预防措施。
-  **切记:** 当您看到此符号时，说明在您工作的产品区域有危险电压的存在。请在开始操作前拔掉产品的电源线，或者在产品必须使用电源来执行任务时，小心从事。

Preface





This manual contains maintenance procedures for service personnel. It is divided into the following chapters:

- 1. **General information** contains a general description of the printer and the maintenance approach used to repair it. Special tools and test equipment, as well as general environmental and safety instructions, are discussed.
 - 2. **Diagnostic information** contains an error indicator table, symptom tables, and service checks used to isolate failing field replaceable units (FRUs).
 - 3. **Diagnostic aids** contains tests and checks used to locate or repeat symptoms of printer problems.
 - 4. **Repair information** provides instructions for making printer adjustments and removing and installing FRUs.
 - 5. **Connector locations** uses illustrations to identify the connector locations and test points on the printer.
 - 6. **Preventive maintenance** contains the lubrication specifications and recommendations to prevent problems.
 - 7. **Parts catalog** contains illustrations and part numbers for individual FRUs.
- Appendix A** contains service tips and information.
Appendix B contains representative print samples.

Conventions

Note: A note provides additional information.
Warning: A warning identifies something that might damage the product hardware or software.

There are several types of caution statements:

	<p>CAUTION</p> <p>A caution identifies something that might cause a servicer harm.</p>
	<p>CAUTION</p> <p>This type of caution indicates there is a danger from hazardous voltage in the area of the product where you are working. Unplug the product before you begin, or use caution if the product must receive power in order to perform the task.</p>
	<p>CAUTION</p> <p>This type of caution indicates a hot surface.</p>
	<p>CAUTION</p> <p>This type of caution indicates a tipping hazard.</p>

1. General information

This Lexmark™ C500 color laser printer is the ideal printer for presentations, business graphics, line art, and text. It uses laser diode electrophotographic technology to deliver remarkable quality print images and text. The printer can be used as a shared network or desktop printer.

Maintenance approach

The diagnostic information in this manual leads you to the correct field replaceable unit (FRU) or part. Use the error code charts, symptom index, and service checks to determine the symptom and repair the failure. See **“Diagnostic information” on page 2-1**, for location of each section. You may find that the removals in the Repair information chapter will help you identify parts. After you complete the repair, perform tests as needed to verify the repair.

Tools required for service

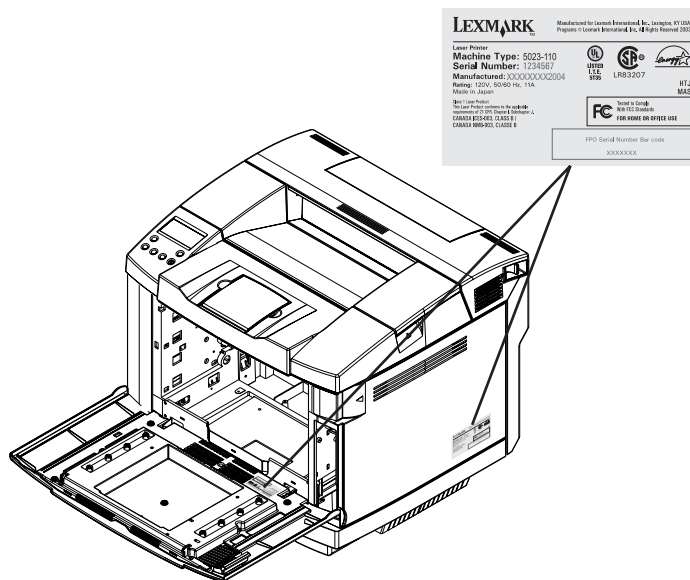
The removal and adjustment procedures described in this manual require the following tools and equipment:

- Analog volt ohmmeter (a digital volt ohmmeter may also be used)
- Flat-blade screwdrivers
- Needle nose pliers
- #1 Phillips screwdriver
- #2 Phillips screwdriver
- Slotted screwdriver #1
- Slotted clock screwdriver #1
- Tweezers, C-ring pliers

When you make voltage readings, always use frame ground unless another ground is specified.

Serial number

Look for serial number information on the right cover and the inside of the front cover of your printer.



Acronyms

ASIC	Application-Specific Integrated Circuit
DPI	Dots Per Inch
DRAM	Dynamic Random Access Memory
EP	Electrophotographic Process
ESD	Electrostatic Discharge
FRU	Field Replaceable Unit
HV	High Voltage
HVPS	High Voltage Power Supply
LAN	Local Area Network
LASER	Light Amplification by Stimulated Emission of Radiation
LCD	Liquid Crystal Display
LED	Light-Emitting Diode
LV	Low Voltage
LVPS	Low Voltage Power Supply
NVRAM	Nonvolatile Random Access Memory
OEM	Original Equipment Manufacturer
POR	Power-On Reset
POST	Power-On Self Test
PQET	Print Quality Enhancement Technology
RIP	Raster Image Processor
VAC	Volts alternating current
VDC	Volts direct current

Specifications

Resolution

600 x 600 dpi
2400 image quality

Model differences

	C500n	C500tn
USB 2.0	X	X
Parallel		
Ethernet	X	X
Memory (MB)	64	64
Options available		
530-sheet drawer (tray 2)	X	

Technical specifications

Color Balance Settings

This printer offers color balance control. It is a color correction option that allows you to increase or decrease the amount of toner going to the page for the cyan, magenta, yellow and black color planes. The scale ranges from +10 to -10.

Physical specifications and weight

The following table contains the dimensions and weights for each printer model and option. This does not include packaging but does include the print cartridge that ships with the printer.

	Width	Depth	Height	Weight ²
	inch	inch	inch	lb
	mm	mm	mm	kg
Printers				
Lexmark C500n ¹	18.9	16.5	15.2	66.0
	480	420	385	29.0
Paper options				
530-Sheet drawer	18.1	18.5	7.3	13.3
	460	470	185	6.0
530-Sheet tray	11.2	14.4	4.5	4.2
	285	365	115	1.9
Standard tray	10.8	13.0	2.2	2.2
	275	330	55	1.0
Legal tray	10.8	15.9	2.2	2.5
	275	405	55	1.1
¹ Comes with standard input tray and starter cartridges.				
² Weight does not include packaging or pubs.				

Operating clearances

Printer sides	C500n	C500n with 530-sheet tray
Left side	8 in (203 mm)	8 in (203 mm)
Right side	20 in (508 mm)	20 in (508 mm)
Front	28 in (711 mm)	28 in (711 mm)
Rear	10 in (254 mm)	10 in (254 mm)
Top	23 in (584 mm)	29 in (736 mm)

Packaging and shipping dimensions

	Width	Depth	Height	Weight
Printers ¹	in	in	in	lb
	mm	mm	mm	kg
C500n	22.6	20.9	22.4	77
	574	530	570	35.0
Options				
530-Sheet drawer	21.7	22.2	10.4	18.8
	550	564	265	8.5
Legal tray	13.2	19.0	5.7	5.5
	335	483	144	2.5
¹ Includes start-up kit (supplies)				

Print speed and performance

	Pages/minute)	
Media size	Standard tray	
Letter	31	8
A4	31	8
Legal	16	8
Transparencies	3	2
Thick card stock	3	2
Labels (letter & A4)	5	3
Medium thick card stock (letter & A4)	4	3
Envelopes	5	3

Time to first print

Time from standby mode	13 seconds	19 seconds
Time from power saver mode	45 seconds	45 seconds
Note: Time to first page (TTFP) is the time from the moment when the host sends the print signal until the moment the trailing edge of the first page leaves the exit feed rollers. TTFP is measured using a simple text (single character) page.		
Note: Warm up time, 45 seconds maximum, is the time elapsed from when the power is turned on to when the ready status is reached.		

Processor

ARM-9, 200 MHz

Duty cycle

Maximum duty cycle-35,000 pages (one month's usage)

Printer memory

Memory configuration

Standard DRAM	64MB
Optional SDRAM	N/A
Max DRAM	64MB

Paper and media specifications

Print area

The printable area is up to 4.0 mm (0.158 in.) from the top and bottom of the media, and up to 3.0 mm (0.118 in.) from the left and right edges. Any information placed outside this specified printable area will not print. Note: For envelopes, the printable area is up to 4.0 mm (0.158 in.) of the left and right edges, and 3.0 mm (0.118 in.) of the top and bottom edges.

Input and output configurations

The following table shows the standard number of input sources and output destinations, as well as the estimated capacity of each. Capacity may vary and is subject to media specifications and printer operating environment. The capacities listed are based on plain paper at 75 g/m².

Sources and capacities	C500n
Input sources	
Number of standard sources	1
Number of optional input drawers	1
Maximum number of input sources ¹	2
Maximum input capacity	780
Input capacities ²	
Standard input	
Primary tray capacity	250
Total standard capacity	250
Optional input	
Optional legal tray capacity	250
Optional tray 1 capacity	250
Optional tray 2 capacity	530
Output destinations	
Number of standard destinations	1
Output capacities	
Standard output bin capacity (top)	
Media up to 20 lb paper	250
¹ Optional input drawer is a 530-sheet capacity drawer. Only one optional drawer may be installed at any time.	
² The printer supports top output (face down) as standard. No additional output options are available.	
Note: All capacities are based on use of 20 lb paper.	

Media input types and weights

Source	Type	Standard tray Legal tray	530-Sheet tray	Printer menu Item	
				Paper type	Paper weight
Paper ^{1,2} (grain long)	Xerographic or bond paper	60-74 g/m ² (16-19 lb)	60-74 g/m ² (16-19 lb)	Plain paper	Light
	Xerographic or bond paper	75-120 g/m ² (20-32 lb)	75-120 g/m ² (20-32 lb)	Plain paper	Normal
	100% Cotton	75-120 g/m ² (24-32 lb)	75-120 g/m ² (24-32 lb)	Plain paper	Heavy
Card stock	Index	163 g/m ² (90 lb)	N/A	Card stock	Normal
	Index	164- 210 g/m ² (91-110 lb)	N/A	Card stock	Heavy
Transparency ³		PN 12A5940 PN 12A5941	N/A	Transparency	
Labels ²			N/A	Label	
Envelopes		75-90 g/m ² (20-24lb)	N/A	Envelope	Normal

¹ Punched, embossed, water-marked, perforated, punched, inkjet paper or plastic-coated media should not be used.

² Only occasional use of paper labels in an office environment is supported.

³ Only PN 12A5940 and 12A5941 should be used.

There is no automatic paper type sensing. These settings should be manually set in the operation panel.

Media sizes

Media sizes	Dimensions		Input			Output
			Standard 250-sheet tray 1	Optional legal tray	Optional 530-sheet tray 2	Standard 250-sheet bin
	mm	in.				
A4	210 x 297	8.27 x 11.7	X	X	X	X
A5	148 x 210	5.83 x 8.27	X			X
JIS B5 ³	182 x 257	7.17 x 10.1	X	X		X
Letter	216 x 279.4	8.5 x 11	X	X	X	X
Legal	216 x 356	8.5 x 14		X		X
Executive	184.2 x 266.7	7.25 x 10.5	X	X	X	X
Folio	216 x 330	8.5 x 13	X			X
Statement	139.7 x 215.9	5.5 x 8.5	X			X
Universal ¹			X	X		X
Standard 250-sheet letter tray	104.8x210 to 215.9x297	4.125x8.27 to 8.5x11.7				
Optional 250-sheet legal tray	104.8x210 to 215.9x355.6	4.125x8.27 to 8.5x14				
Envelope sizes	Dimensions	Dimensions				
9 Envelope ²	98.4x225.4	3.875 x 8.9	X	X		X
COM 10 Envelope	104.8 x 241.3	4.12 x 9.5	X	X		X
DL Envelope	110 x 220	4.33 x 8.66	X	X		X
C5 Envelope ²	162 x 229	6.38 x 9.01	X	X		X
B5 Envelope ²	176 x 250	6.93 x 9.84	X	X		X
¹ Select Universal when using a non-standard size sheet of print material. The printer formats the page for the maximum size 8.5 X 14 in.(215.9 X 355.6 mm). Set the actual size from your software application.						
² Supported through the driver.						
³ B5 may be supported in optional tray 1, but size sensing must be turned off.						

Output capacity by media and source

Source	Media	Capacity	Orientation
Standard output bin (top) ¹	Supports all sizes listed in the "Media sizes" table	250 sheets (20 lb paper) 50 Transparencies	Collated Face down

Media guidelines

Paper designed for use with xerographic copiers should provide satisfactory print quality and feed reliability. Other media types may be suitable. We recommend that users test any particular brand for suitability to their applications. Refer to the printer User's Reference for additional media specifications.

Paper

- Rough, highly textured, limp, or pre-curved papers will result in lower print quality and more frequent paper feed failures.
- Colored papers must be able to withstand 338°F (170°C) fusing temperature.
- Preprinted forms and letterheads should be selected using guidelines in the printer User's Reference. The chemical process used in preprinting may render some papers unsuitable for use with the printer.
- Unsuitable papers include punched, embossed, water-marked, perforated media, any kind of inkjet paper or plastic-coated paper.
- Recycled paper less than 75 g/m² (20 lb) may cause unacceptable results.

The laser printing process heats paper to high temperatures of 170°C (338°F). Use only paper able to withstand these temperatures without discoloring, bleeding, or releasing hazardous emissions. Check with the manufacturer or vendor to determine whether the paper you have chosen is acceptable for laser printers.

Envelopes

Should be fed with short edge first, flap down and to the right.

- If envelope wrinkling occurs, refer to the User's Reference for correct loading and stacking of envelopes.
- All envelopes should be new, unused, and without damage.
- Envelopes with excessive curl or twist exceeding 6.0 mm, those stuck together, those with bent corners or nicked edges, or those that interlock should not be used.
- Minimum weight: 90 g/m² (24 lb).
- The following envelopes should not be used:
 - Envelopes with windows, holes, perforations, cutouts, or deep embossing
 - Envelopes with metal clasps, string ties, or metal folding bars
 - Envelopes with exposed flap adhesive when the flap is in the closed position
 - Self-seal envelopes
- Under high humidity conditions (over 60%), the envelopes may seal during printing.
- For best results, print on new 90 g/m² (24 lb) sulfite or 25% cotton-bond envelope.

Transparencies

- Use letter (12A5940) or A4-size (12A5941) sheets only.
- Transparencies are only supported in tray 1 (standard or legal trays).

Labels

- Labels should be selected using guidelines found in the User's Reference, Complete Printer Reference, or the Card stock & Label Guide (located at www.lexmark.com), and tested for acceptability.
- Vinyl labels are not supported.
- Labels are only supported in tray 1 (standard or legal trays).

Glossy Paper

- Use letter (12A5950) or A4-size (12A5951) sheets only.
- Glossy paper is only supported from tray 1 (standard or legal trays).

Sensing by source

Input	Paper size	Paper out	Tray present
Integrated 250-sheet	X	X	X
Optional 530-sheet	X	X	X

Connectivity

Cables

Personal computers

- For USB attachment, a USB cable (P/N 12A2405) is recommended and must be ordered separately.

Operating systems

This printer is compatible with applications running under the following operating systems for either local or network connections:

Apple Macintosh

- Mac OS 8.6, 9.x, OS X

Download the latest Lexmark printer PPD files or printer drivers from the Lexmark Web Site.

Microsoft Windows

- Microsoft Windows 98 2nd Edition
- Microsoft Windows Me
- Microsoft Windows NT 4.00
- Microsoft Windows NT 4.00 Server
- Microsoft Windows 2000 Professional
- Microsoft Windows 2000 Server
- Microsoft Windows 2000 Advanced Server
- Microsoft Windows XP Home
- Microsoft Windows XP Professional
- Microsoft Windows Server 2003

Download the latest printer drivers from the Lexmark Web Site.

The Windows software applications, which operate in the operating systems listed above, are best suited to run with the drivers supplied with this printer. The drivers for Windows take advantage of your printer functions and increase the printer performance wherever possible.

The software applications that operate with most Apple LaserWriter printers will generally operate with this printer.

Network Connections

Internal Network Connections

The Lexmark C500n printer comes standard with Ethernet 10/100BaseTX built into the controller board.

Internal Print Servers

The standard Ethernet connection and optional N2100 Series print servers support the following protocols:

- TCP/IP—The TCP/IP standard set of application services are supported including DHCP, BOOTP, WINS, SNMP (mib-2, host resources MIB, printer MIB, enterprise MIB, SNMP traps), HTTP, LPR/LPD, FTP, IPP1,SLP, DDNS
- AppleTalk

This printer with standard Ethernet supports an Embedded Web Server. The current status of the operator panel is viewable using the resident web pages.

Standard Interfaces

This printer ships with the following interfaces:

- Ethernet 10/100 Base TX
- USB 2.0 supporting full speed (12Mb /s) data transfer.

Note: The ethernet and USB interfaces may be used simultaneously.

The USB interface supports:

- Windows 98 SE
- Windows Me
- Windows NT
- Windows 2000 Professional
- Windows XP Operating Systems
- Windows Server 2003 Operating Systems
- Apple Mac OS 9.x, 10.1, 10.2, 10.3, 10.4

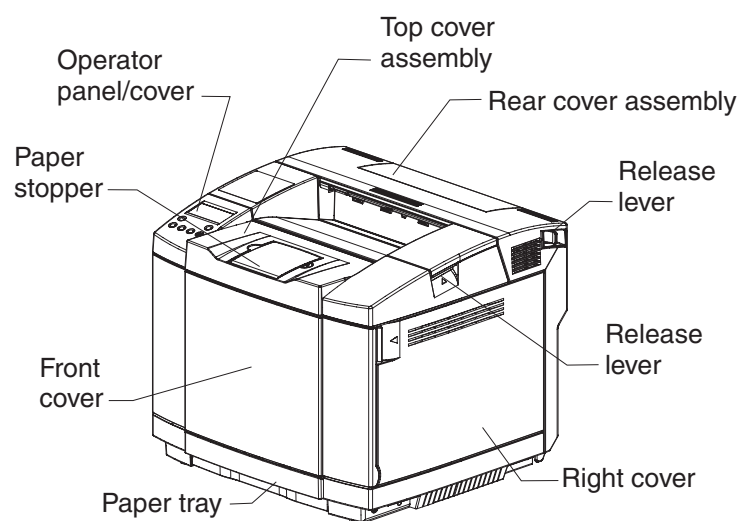
Power and electrical specifications

Printing states	C500n
Off	0 W
Average power while printing	
Continuous printing	670 W
Power consumption, standby	
Power saver on	35 W
Power saver off	200 W
Maximum current while printing	
115 Volts	11 A
230 Volts	6 A
Average current while printing	
115 Volts	6.5 A
230 Volts	3.0 A

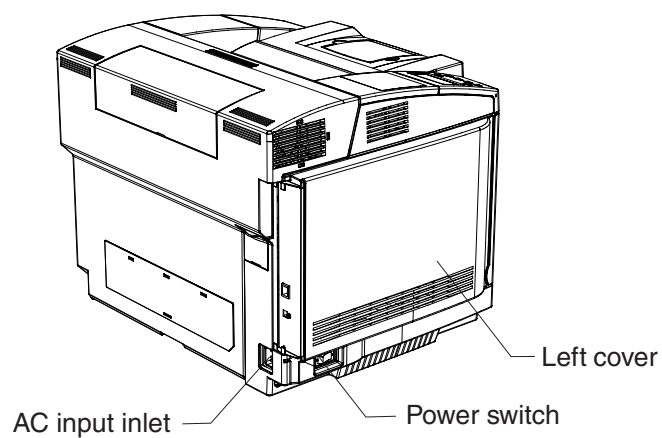
Environment

Environment	Specifications
Operating	
Air temperature - product operating	10 to 32.5°C (50 to 90.5°F)
Air temperature - product power off	5 to 35°C (41 to 95°F)
Air relative humidity	15 to 80%
Altitude	0 - 2,500 m (0 - 8,200 ft.)
Ship / Storage	
Temperature-printer and supplies	0 to 35°C (32 to 95°F) ¹
Relative humidity	10 to 90% RH
Atmospheric pressure	613 to 1607 hPa (460 to 800 mm Hg)
¹ Severe High 35 to 40°C (95 to 104°F), Severe Low -10 to 0°C (14 to 32°F). The period under severe shall not be deemed to be continuous, but rather a total of such intermittent periods (48 hours at most for any one period).	

Printer identification



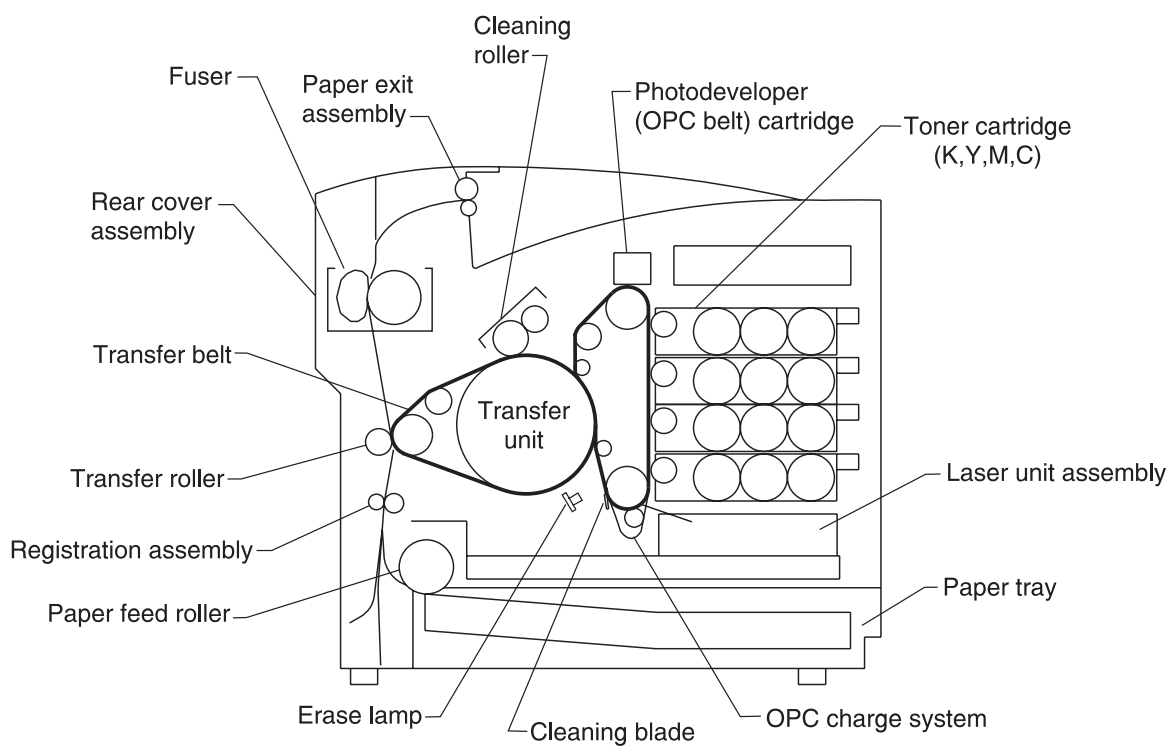
Front view



Back view

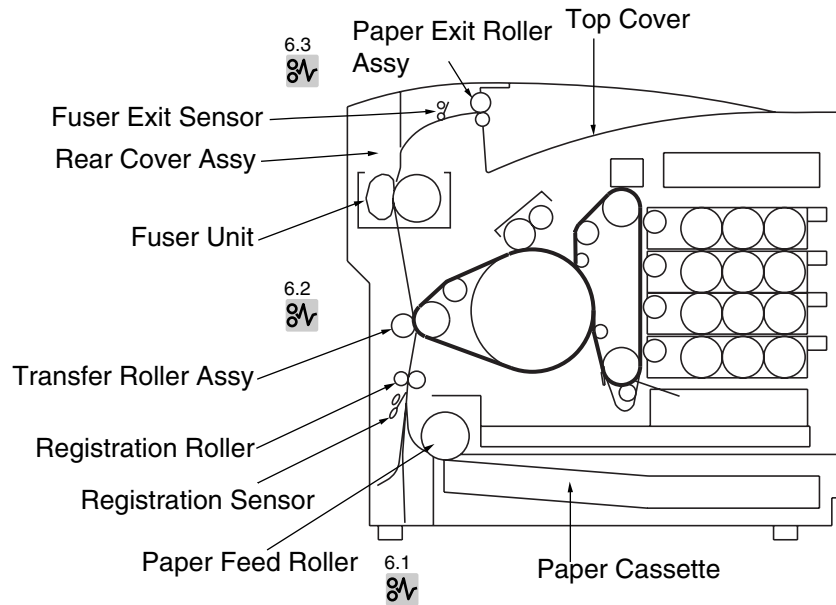
Printer theory of operation

The following diagram shows the major parts of the printer and paper path.



Printer paper path

The following illustration shows the paper path and the associated paper jam messages for jams at specific points in the paper path. The printer depicted in the illustration has a duplex unit and secondary paper feed assembly installed:



Printer systems description

See the illustration “**Printer component systems**” on page 1-17, for more information.

Basic principles of color printing

Color printing is made through the subtractive process of combining the three primary colors: yellow, magenta, and cyan.

Mechanical and electrical structures

This color laser printer consists of five engineering systems: print, transfer, optical, paper transport, and control system.

Print system

The print system consists of six functional parts located around the optical photoconductor (OPC) belt and forms a toner image on the OPC belt: charge, expose, develop, first transfer, discharge, and clean.

Transfer system

The transfer system consists of three functional parts that transfers the toner image formed on the transfer belt to paper: transfer belt unit, second transfer, and cleaning roller.

Optical system

The optical system consists of two functional parts that forms an electrostatic latent image on the OPC belt using a laser light: optical unit and scanner motor (SCM).

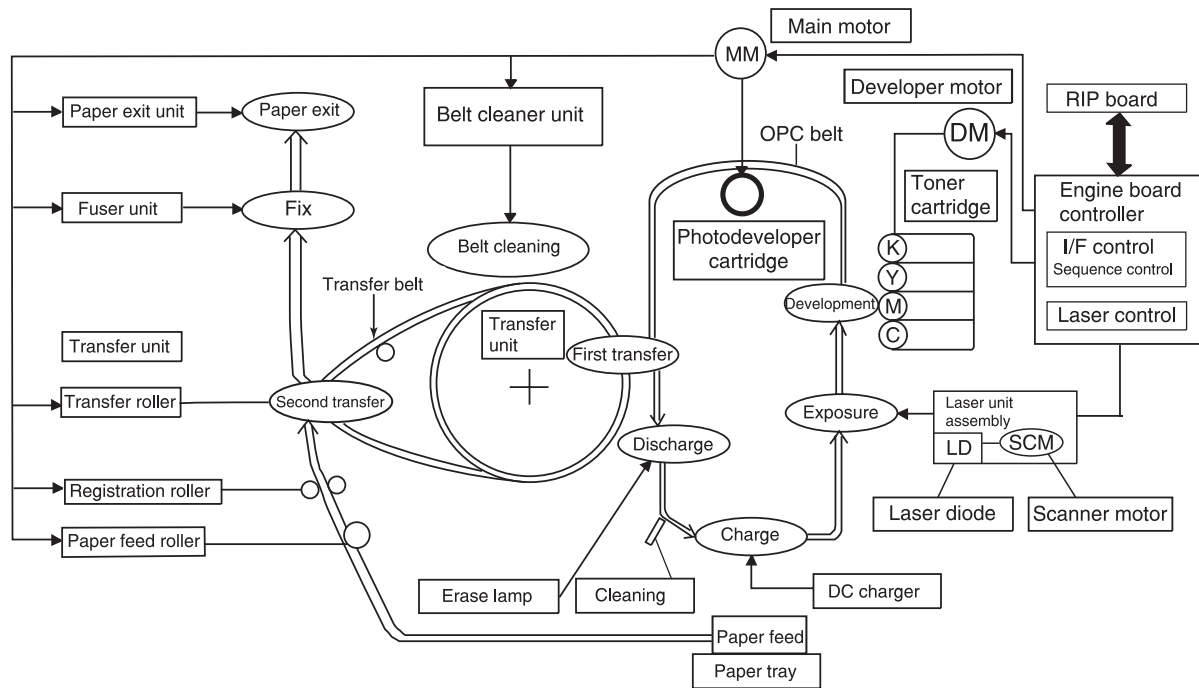
Paper transport system

The paper transport system consists of five functional parts that picks up paper from the paper tray, separates the transported paper from the transfer belt, and exits it from the printer after fusing the toner image on the paper: paper tray, transport, fuser, and paper exit.

Control system

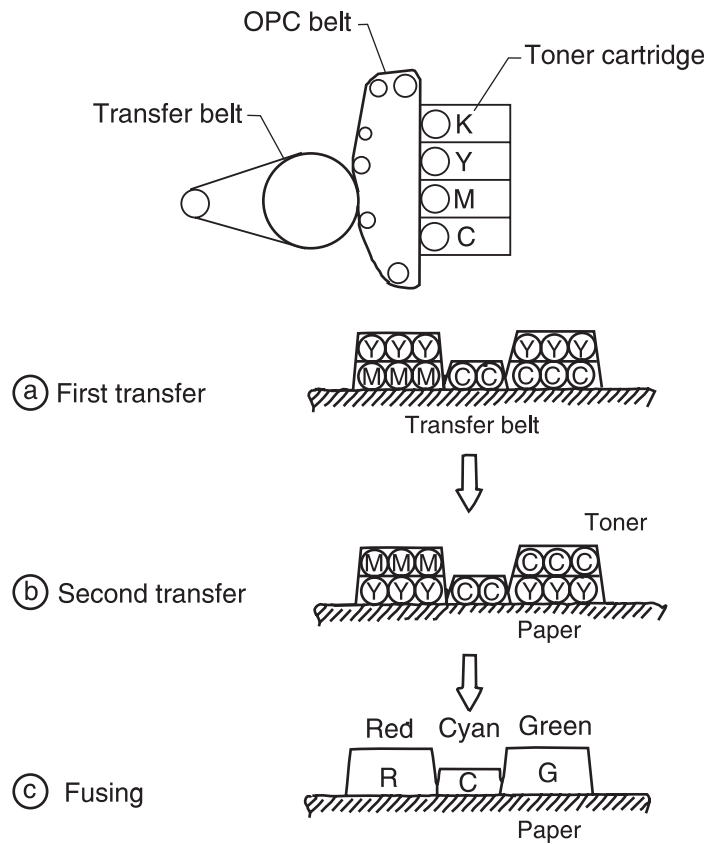
The control system consists of four control parts and runs the printer by processing the interface signals transmitted from the computer and the other printer systems such as the print, transfer, optical, and transport system: sequence control, laser control, fusing temperature control, and interface control.

Printer component systems



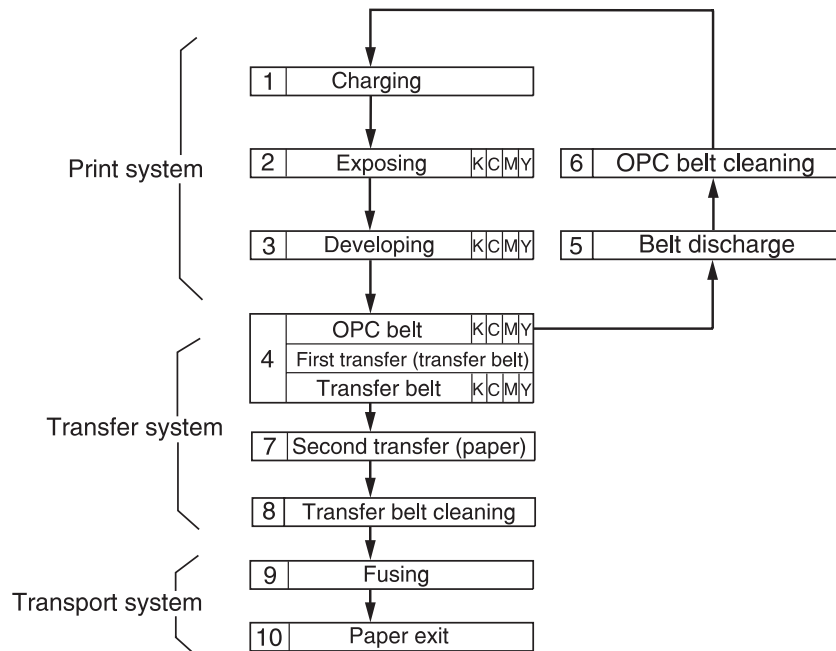
Basic process of color printing

1. This printer has a toner cartridge for each color — yellow, magenta, cyan, and black.
2. The toner image is developed with primary colors and then transferred to the transfer belt for color combination.
3. The toner image formed on the transfer belt is transferred to paper.
4. The toner is fused to the paper by the thermal fuser unit. During the fusing process, the primary colors mix, yielding the desired color.



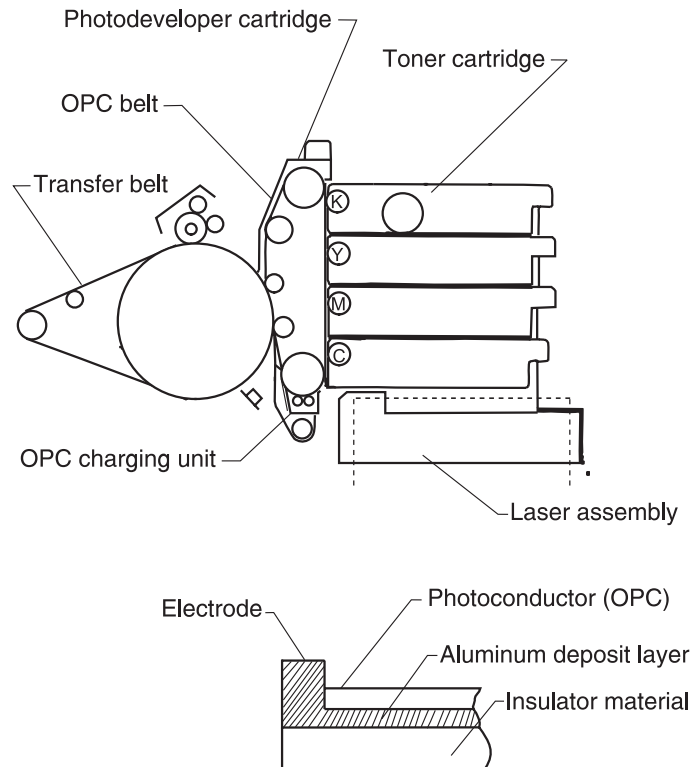
Print system and transfer system

This illustration shows the basic structure of the print system having the OPC belt as a main function, and the transfer system including the transfer belt. A color print is accomplished by actuating each process in the print system and the transfer system.



Structure of OPC belt (photo developer cartridge)

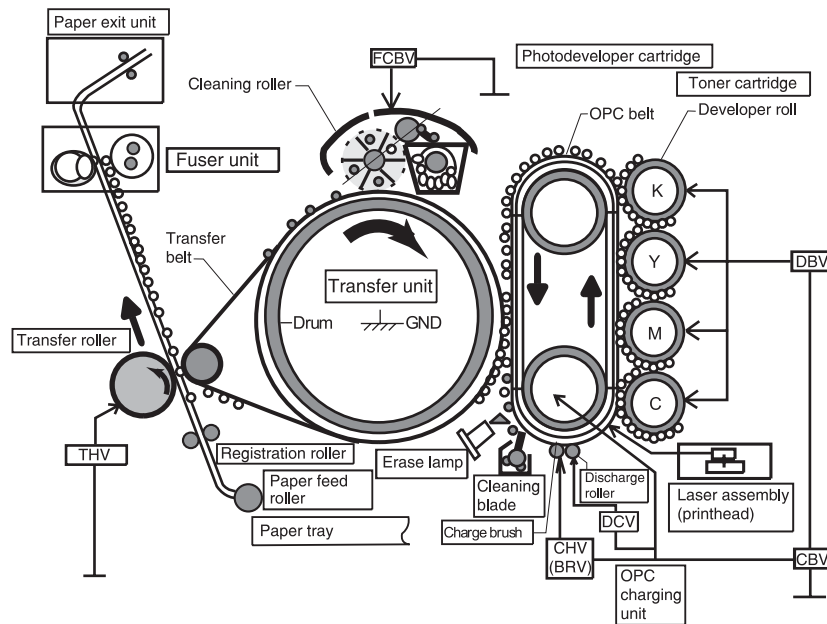
The OPC belt consists of a surface layer having an optical photoconductor (OPC) of organic material, the inner layer consists of an insulator material (PET), and the aluminum deposit layer in between. The OPC belt is a main part of the print system.



Basic structure of the print system

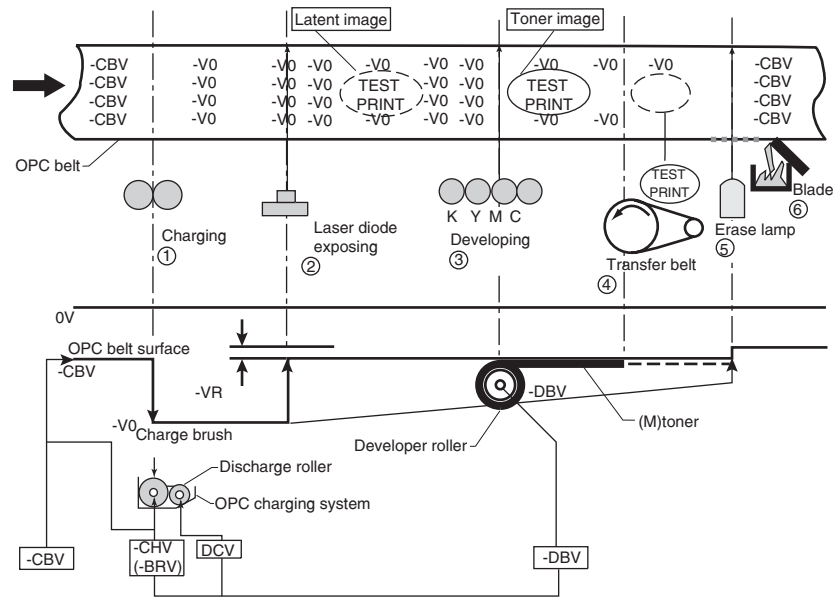
The print system process consists of the following:

1. The OPC belt is biased to the -CBV(V) by power supply CBV.
2. The OPC belt is then evenly charged to the negative high voltage by the OPC charging system. The charging system consists of a charging brush that is biased by power supply CHV and a discharge roller that is biased by power supply DCV.
3. The developer roller in the toner cartridge is biased to -DBV(V) by power supply DBV.
4. Frame potential of transfer drum is GND.



5. Variation of the OPC belt potential:

- a. The OPC belt is biased to $-CBV(V)$.
- b. The OPC belt surface is evenly charged to $-Vo(V)$ during the charging process.
- c. During the exposing process, the optical unit emits a laser beam that strikes the OPC belt surface forming an electrostatic image. The electrostatic image is at $-VR(V)$ potential.
- d. The negatively charged toner is moved to the OPC belt in the development process due to the difference between $-VR(V)$ and $-DBV(V)$. A visible image is the result.
- e. The negatively charged toner on the OPC belt is moved to the transfer belt because the potential GND of the transfer belt is greater than $-VR(V)$ of the OPC belt.
- f. The OPC belt is discharged by the erase lamp radiating on the OPC belt.



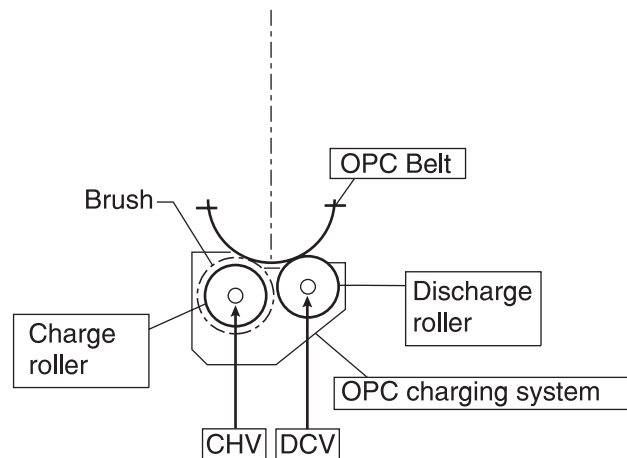
Details of the print system

Charging process

In the charging process, the OPC belt is evenly charged by the charger. See “**Printer theory of operation**” on page 1-14 for charger unit location.

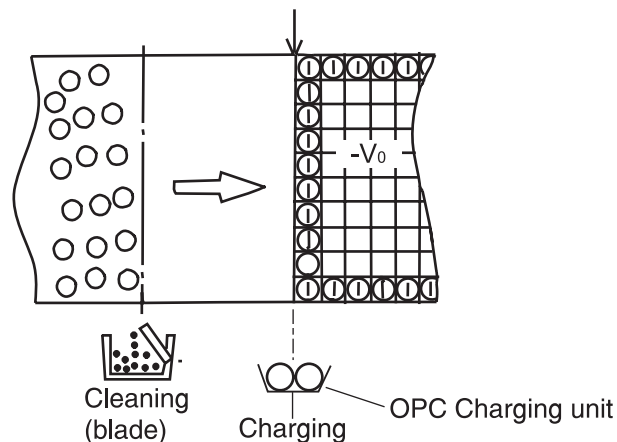
The charger unit consists of a charging brush and a discharge roller.

1. The charge brush charges the OPC belt surface to $-V_o(V)$ potential. The charge on the surface of the OPC belt is then smoothed to an even $-V_o(V)$ by the discharge roller.
2. The charger unit controls the grid to a constant voltage of $ZD(V)$ for even charging.



3. Before charging, the OPC belt surface is $-CBV(V)$.

The charger unit evenly charges the OPC belt surface to $-V_o(V)$ by generating a negative charge.



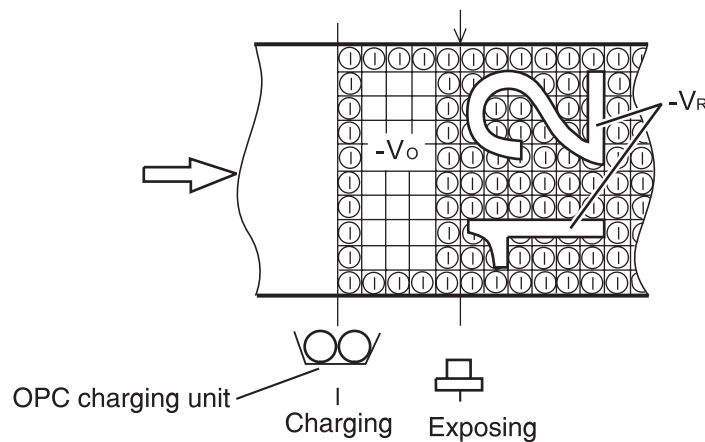
Exposing process

In the exposing process, the OPC belt surface is exposed to the laser light which forms an electrostatic latent image.

The luminous source of the laser is a semiconductor laser. See “**Printer theory of operation**” on **page 1-14** for optical unit location.

The laser light scans the OPC belt, forming an electrostatic latent image.

1. The OPC belt surface is charged to $-V_o(V)$ potential.
 - a. The laser scans the OPC belt in a rectangular pattern during forward movement of the OPC belt.
 - b. High speed switching of the laser matches the transmitted image data.
 - c. The charge of the areas radiated by the laser light is discharged, creating a $-V_R(V)$ potential.
 - d. An electrostatic latent image is formed (invisible) on the OPC belt.



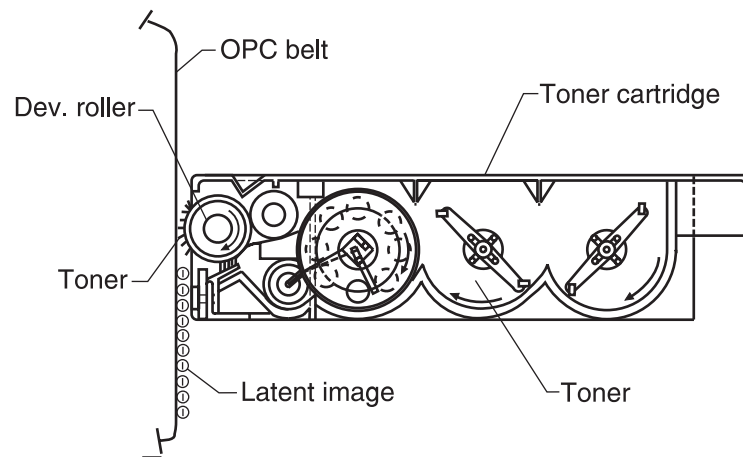
Developing process

In the developing process, an electrostatic latent image attracts printer toner and becomes visible on the OPC belt.

There are four toner cartridges. See **“Printer theory of operation” on page 1-14** for toner cartridges location. The toner cartridges are located in the printer from top to bottom in the order of black, yellow, magenta, and cyan.

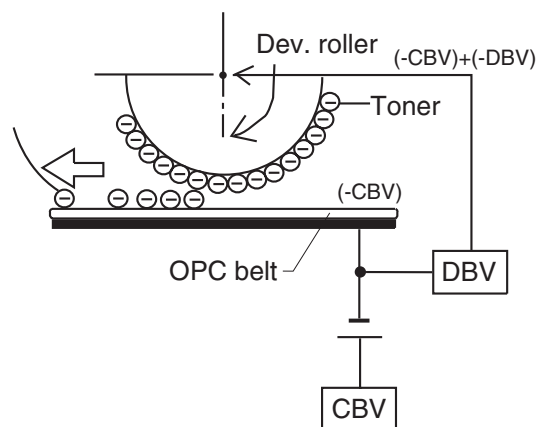
1. Toner adheres to the developer roller.

The developer roller makes contact with the surface of the OPC belt which begins the developing process.

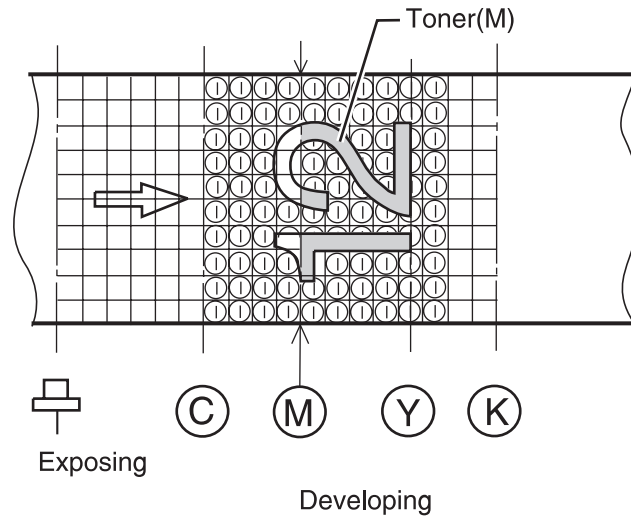


2. The developer roller has been biased to $-DBV(V)$ potential.

The first illustration shows the relationship between the toner, the $-Vo(V)$ at the non-exposed area of the OPC belt and the $-VR(V)$ at the exposed area of the OPC belt.



3. Developing is processed by toner adhering to the OPC belt due to the attraction between the toner and the -VR(V) charge at the exposed area of OPC belt. The toner image becomes visible on the OPC belt.

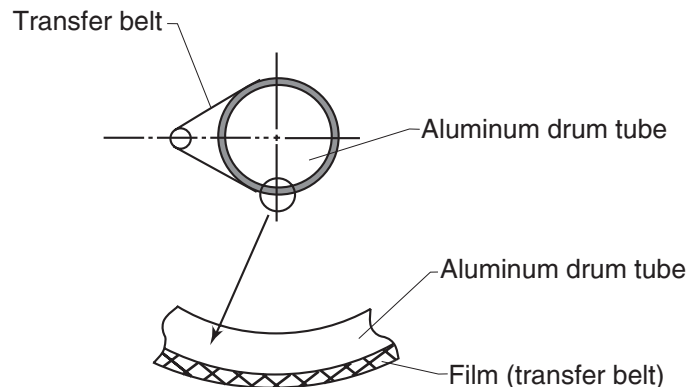


Note: No developing takes place on the non-exposed area because the potential of toner and that of the non-exposed area of the OPC belt is an identical pole and therefore, repels.

First transfer (drum) process

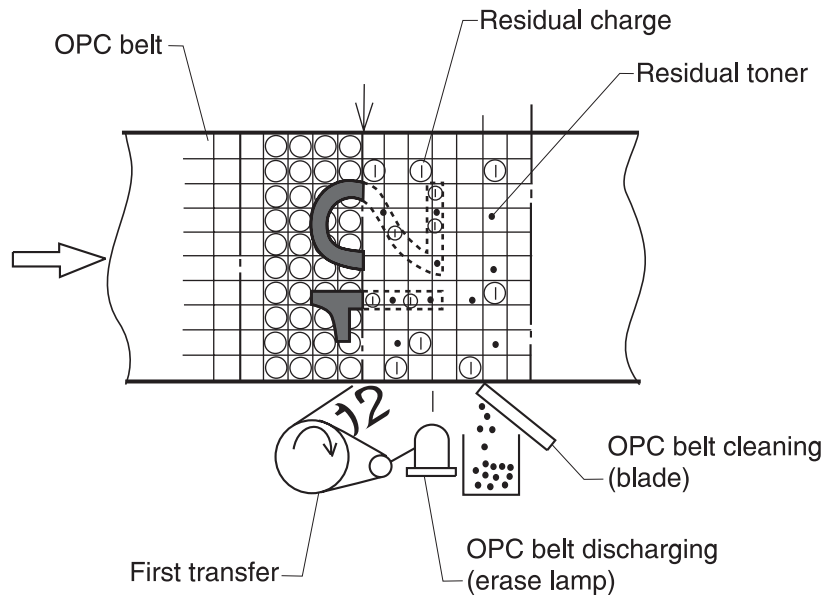
The first transfer process consists of toner images on the OPC belt being transferred to the transfer belt. The transfer belt is composed of a special rubber. See “**Printer theory of operation**” on **page 1-14** for transfer belt location.

1. After the development process, the OPC belt rotates making contact and synchronizing with the transfer belt and the aluminum drum.



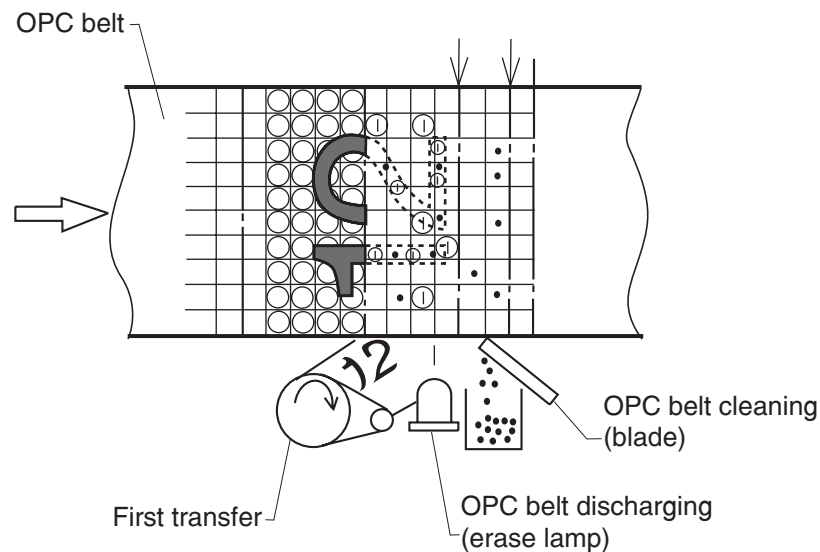
2. The OPC belt has been biased to -CBV(V) potential. The potential of the transfer belt and drum is nearly GND.
3. Toner on the OPC belt is moved to the transfer belt. This occurs because of the difference of potential between the OPC belt and the transfer belt. Toner that has been developed, in each color, is moved from the OPC belt to the transfer belt and the two color toner image is overlapped on the transfer belt.

4. The toner image is then transferred to paper.



Belt discharge (erase lamp) process

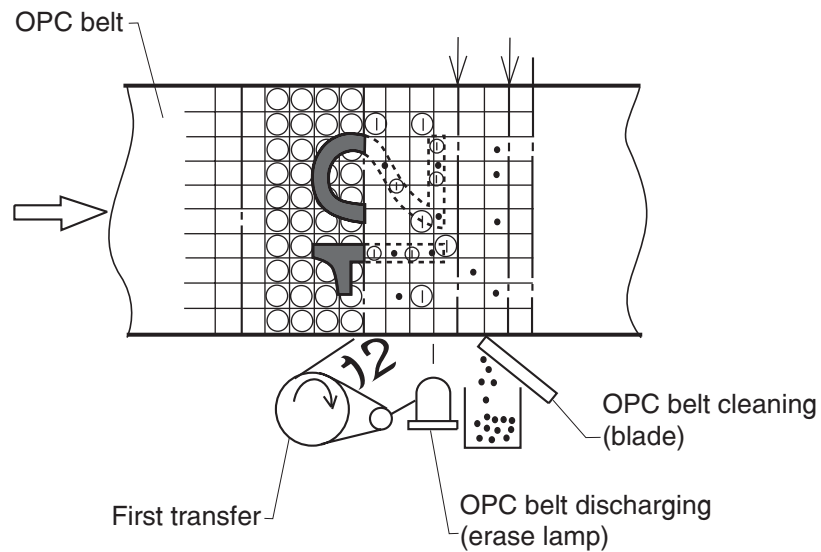
Electrical belt cleaning is accomplished by an erase lamp radiating on the OPC belt. Radiation discharges the residual charge -VR(V) remaining on the belt after the first transfer process. Electrical cleaning occurs after each toner color transfer. The erase lamp is a luminous source consisting of 24 light emitting diodes. After the electrical belt cleaning, the OPC belt is cleaned with a mechanical blade.



Belt cleaning process

In the belt cleaning process, residual toner adhering to the OPC belt surface is mechanically removed by a blade edge.

The residual toner is collected in a waste toner container located by the waste toner feeder.

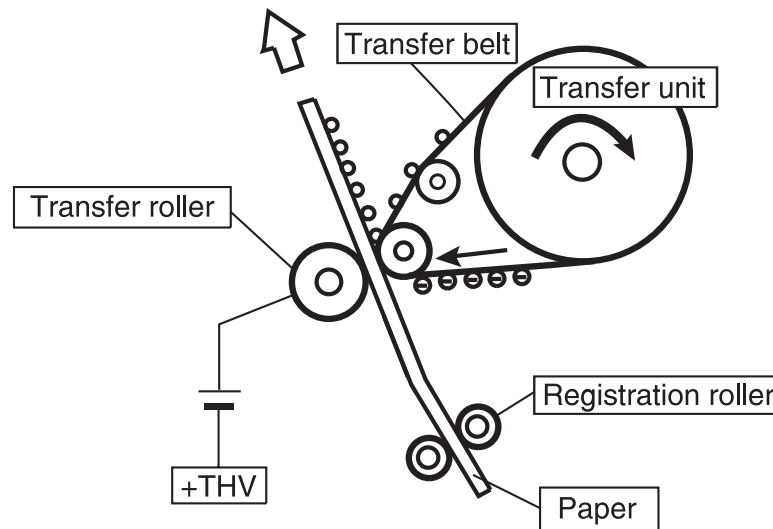


Details of the transfer system

Second transfer (paper) process

In the second transfer process, the toner image on the transfer belt is transferred to paper. See “**Printer theory of operation**” on page 1-14 for second transfer roller location.

The transfer roller, normally separated from the transfer belt, is positively biased by the power supply THV. The transfer roller contacts the transfer belt as paper passes between the transfer roller and the transfer belt. The positive bias of the transfer roller causes the toner to release from the transfer belt and adhere to the paper.



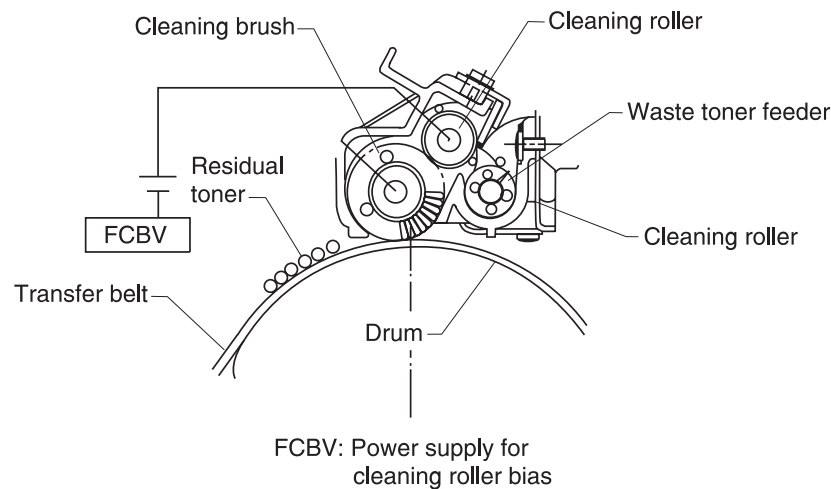
THV: Power supply for transfer roller bias

Transfer belt cleaning process

The residual toner on the surface of the transfer belt is removed after the paper transfer process. See **“Printer theory of operation” on page 1-14** for transfer belt cleaner unit location.

The belt cleaner brush is a semiconductor-type fur brush. The cleaning roller is charged by voltage FCBV. The resistance of the cleaning brush against the cleaning roller charges the brush. The brush in turn contacts the surface of the rotating transfer belt. The negatively charged toner adheres to the positively charged (FCBV) brush, which cleans the transfer belt. The cleaning brush does not contact the transfer belt during the imaging process.

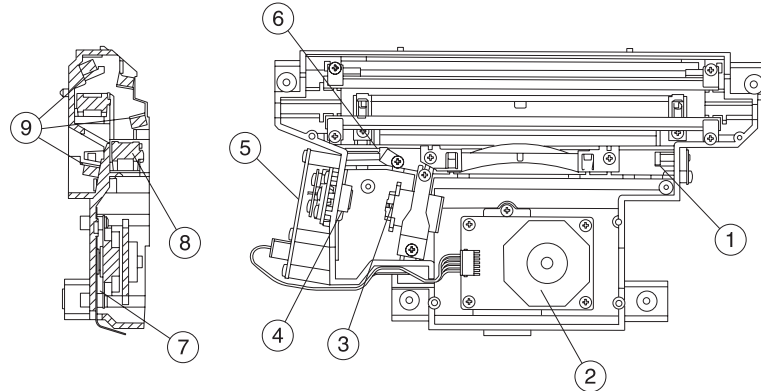
Waste toner, adhering to the surface of the cleaning roller, is removed by the cleaning blade, routed by the waste toner feeder to the waste toner container where it is deposited.



Details of the optical system

In the optical system process, the printer utilizes a semiconductor laser diode as a light source. This laser diode is controlled by fast switching which matches the transmitted image data (video signal).

The generated laser light scans the OPC belt through a polygon mirror and lens. The electrostatic latent images are formed on the OPC belt.

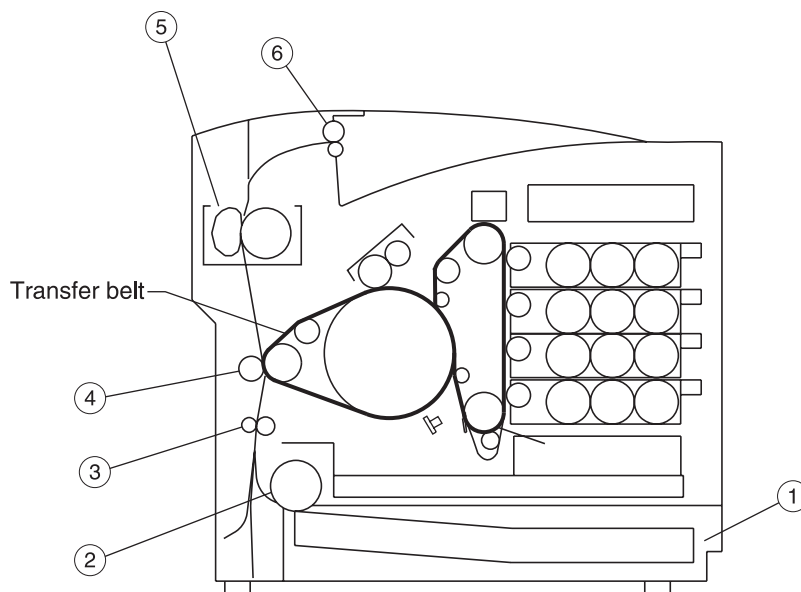


The Optical printhead unit consists of following parts:

No.	Description
1	PD: photo detector
2	Polygon mirror: hexahedral mirror that reflects the laser beam
3	Cylinder lens: laser beam condenser
4	Laser unit: laser diode light emitting source
5	LDC: laser diode control circuit
6	BTD mirror: beam timing detector mirror to guide the laser beam to PD
7	Scanner motor: rotates the polygon mirror
8	F-lens: laser beam focus lens
9	Mirror: laser beam path reflecting mirror

Details of the paper transportation system

In the paper transportation process, paper is automatically fed by the pick-up roller and transported to the registration roller. The registration roller synchronizes with the transfer belt. The registration roller transports the paper to the transfer roller. During the transfer process, the transfer roller forwards the paper to the fuser rollers. During the fusing process, the fuser rollers transport the fused paper to the exit roller and the exit roller pushes the final paper out of the rear cover assembly.

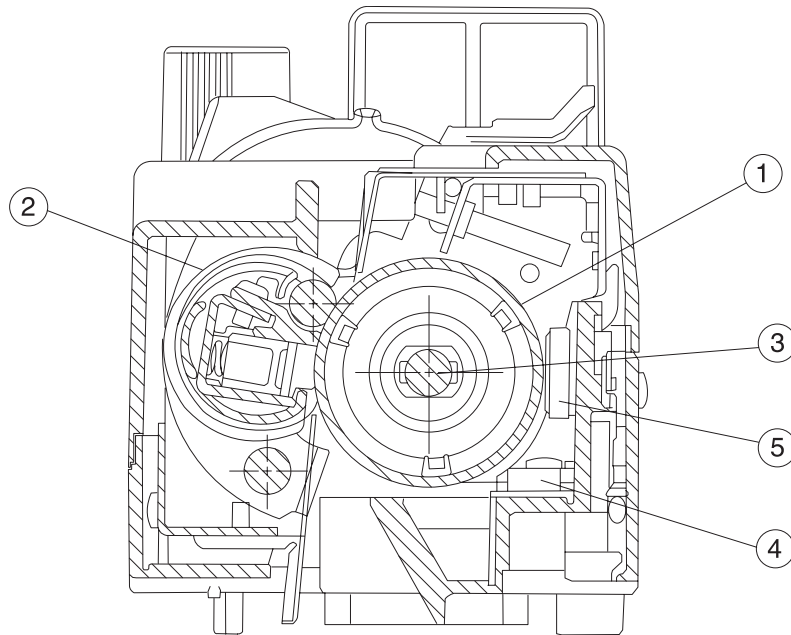


The paper transportation system consists of the following parts:

No.	Part	Function
1	Paper tray	Accommodates paper to be automatically fed through the printer.
2	Pick-up roller	Feeds paper one by one, preventing multi-feed.
3	Registration roller	Transports and synchronizes paper with the transfer belt.
4	Transfer roller	Works in conjunction with the transfer belt to transfer the image to paper and to transport the paper to the fuser.
5	Fuser unit	Utilizes a heat roller to fuse the toner image to the paper.
6	Paper exit roller	Exits the fused paper from the printer.

Fusing unit

The fusing unit utilizes a thermal fusing system that contains a heated fusing roller and a belt-like backup roller. The heated roller contains an inner heating element. The backup roller contains three pressure members located behind the belt. Paper carrying a toner image passes between the rollers where heat and pressure are applied to the paper to fuse the toner to the paper.

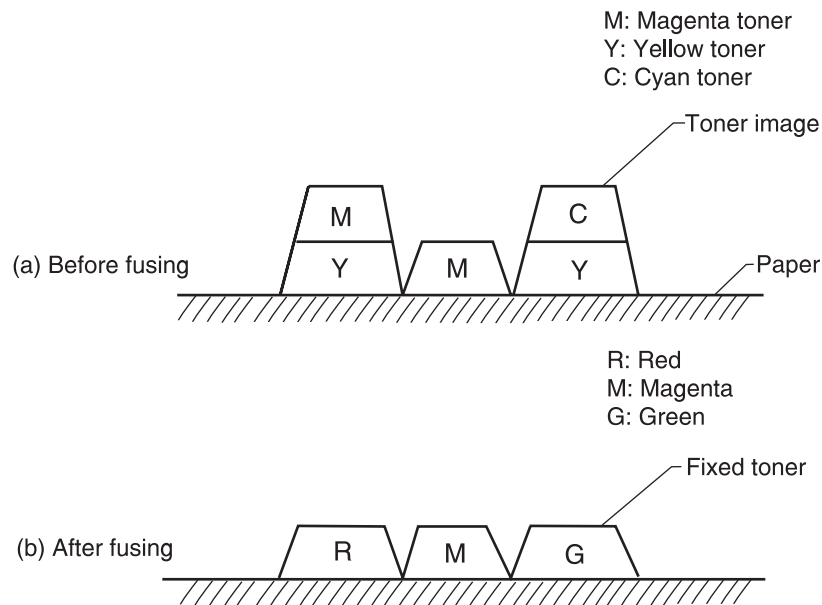


The fusing unit consists of the following components:

No.	Part	Function
1	Fusing roller	Used for fusing, containing a heater.
2	Back-up roller	Pressure roller.
3	Fusing heater	Heating device heated by a halogen lamp.
4	Thermistor	Sensor that detects the temperature of the fuser roller's surface.
5	Thermal fuse	Protective device that prevents the fuser roller from being excessively heated.

Fusing process

1. When the paper reaches the fuser, the toner image is transferred on the paper, but not yet fused to the paper.
2. The transported paper passes between the heated roller and the back-up roller. The heated roller's temperature is approximately 338°F (170°C).
3. When the paper with toner image passes between the heated roller and the backup roller, the heat from the heated roller in combination with the pressure between the two rollers, melts the toner, fusing it to the paper.
4. The fused paper then separates from the rollers and is transported out of the printer into the output bin or is routed back into the printer for printing on the other side of the duplex print.



Control system structure

Electrical system and function

The engine board controls most of the main electrical parts in this printer.

No.	Control process	Function
1	Print process control	Controls print process from paper feed through paper exit.
2	Laser output control	Automatically controls laser output to the default.
3	Fuser temperature control	Controls fuser heater, allowing heated roller to reach default temperature.
4	Toner sensing control	Controls sensing of toner empty status.
5	Interface control (video signal)	Processes the input and output signal with external controller computer.
6	Operator panel indicator	Displays printer operation status.
7	Error control	Controls safe stop procedures when errors occur.

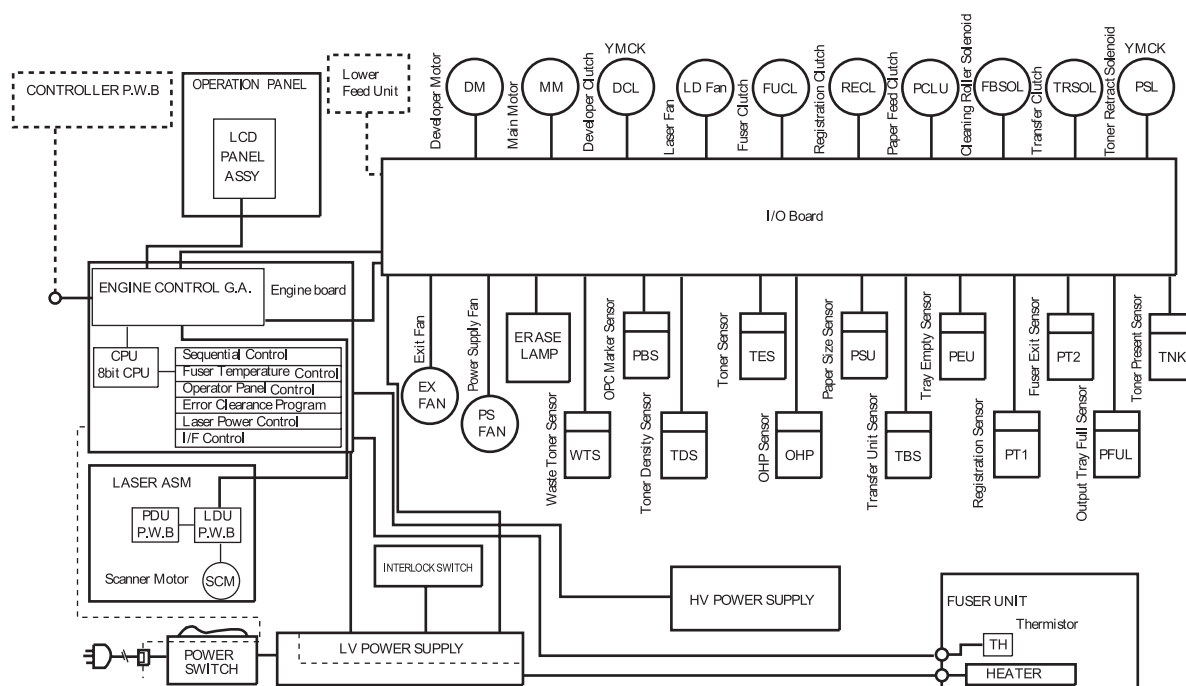
Control of print process

Control block diagram

No.	Control process	Function
1	Sequence control	Controls print sequence of printer.
2	Temperature control	Controls temperature of fuser unit.
3	Consumables' life control	Controls toner empty status for each toner cartridge and life of periodic replacement parts.
4	Operator panel control	Controls operator panel indication and operator signals.
5	Error processing control	Senses errors occurring as well as stop procedures.
6	Interface control	Controls receipt and transmission of interface signals from external controller.
7	Laser control	Controls laser scanning and laser power.

Note: A micro CPU mounted on the engine board controls the print processes.

Print sequence diagram



Laser drive control circuit

The laser drive control circuit (LDC) consists of a video signal input circuit, laser drive circuit, laser diode, output sensing circuit, and output control circuit. See the illustration.

1. When the video signal is received, the laser drive control circuit switches the laser diode switch on and radiates according to the video signal.
2. The radiated laser beam senses the photo detector (PD). The detected signal is returned to the output control circuit.
3. The output control circuit controls the radiated output to a constant, by comparing the laser output default with the feedback value transmitted from the output sensing circuit.
4. The laser beam, scanned by the scanner motor, is sensed by the beam detector (PD), and then outputs the beam detecting timing (BDT) signal.

